TABLE I–6 TO SUBPART I OF PART 98—DEFAULT EMISSION FACTORS ($1–U_{ij}$) FOR GAS UTILIZATION RATES (U_{ij}) AND BY-PRODUCT FORMATION RATES (B_{ijk}) FOR LCD MANUFACTURING

Process type factors	Process Gas i								
	CF_4	C_2F_6	CHF_3	CH_2F_2	C_3F_8	c-C_4F_8	NF_3 Remote	NF_3	SF_6
Etch $1–U_i$	0.6	NA	0.2	NA	NA	0.1	NA	NA	0.3
Etch BCF_4	NA	NA	0.07	NA	NA	0.009	NA	NA	NA
Etch $BCHF_3$	NA	NA	NA	NA	NA	0.02	NA	NA	NA
Etch BC_2F_6	NA	NA	0.05	NA	NA	NA	NA	NA	NA
CVD $1–U_i$	NA	NA	NA	NA	NA	NA	0.03	0.3	0.9

Notes: NA denotes not applicable based on currently available information.

TABLE I–7 TO SUBPART I OF PART 98—DEFAULT EMISSION FACTORS ($1–U_{ij}$) FOR GAS UTILIZATION RATES (U_{ij}) AND BY-PRODUCT FORMATION RATES (B_{ijk}) FOR PV MANUFACTURING

Process type factors	Process Gas i								
	CF_4	C_2F_6	CHF_3	CH_2F_2	C_3F_8	c-C_4F_8	NF_3 Remote	NF_3	SF_6
Etch $1–U_i$	0.7	0.4	0.4	NA	NA	0.2	NA	NA	0.4
Etch BCF_4	NA	0.2	NA	NA	NA	0.1	NA	NA	NA
Etch BC_2F_6	NA	NA	NA	NA	NA	0.1	NA	NA	NA
CVD $1–U_i$	NA	0.6	NA	NA	0.1	0.1	NA	0.3	0.4
CVD BCF_4	NA	0.2	NA	NA	0.2	0.1	NA	NA	NA

Notes: NA denotes not applicable based on currently available information.

TABLE I–8 TO SUBPART I OF PART 98—DEFAULT EMISSION FACTORS ($1–U_{N2O\ j}$) FOR N_2O UTILIZATION ($U_{N2O\ j}$)

Process type factors	N_2O
CVD $1–U_i$	0.8
Other Manufacturing Process $1–U_i$	1.0

Subpart J [Reserved]

Subpart K—Ferroalloy Production

§ 98.110 Definition of the source category.

The ferroalloy production source category consists of any facility that uses pyrometallurgical techniques to produce any of the following metals: ferrochromium, ferromanganese, ferromolybdenum, ferronickel, ferrosilicon, ferrotitanium, ferrotungsten, ferrovanadium, silicomanganese, or silicon metal.

§ 98.111 Reporting threshold.

You must report GHG emissions under this subpart if your facility contains a ferroalloy production process and the facility meets the requirements of either § 98.2(a)(1) or (2).

§ 98.112 GHGs to report.

You must report:

(a) Process CO_2 emissions from each electric arc furnace (EAF) used for the production of any ferroalloy listed in § 98.110, and process CH_4 emissions from each EAF that is used for the production of any ferroalloy listed in Table K–1 to subpart K.

(b) CO_2, CH_4, and N_2O emissions from each stationary combustion unit following the requirements of subpart C of this part. You must report these emissions under subpart C of this part (General Stationary Fuel Combustion Sources).

[74 FR 56374, Oct. 30, 2009, as amended at 75 FR 66461, Oct. 28, 2010]

§ 98.113 Calculating GHG emissions.

You must calculate and report the annual process CO_2 emissions from each EAF not subject to paragraph (c) of this section using the procedures in either paragraph (a) or (b) of this section. For each EAF also subject to annual process CH_4 emissions reporting, you must also calculate and report the annual process CH_4 emissions from the

EAF using the procedures in paragraph (d) of this section.

(a) Calculate and report under this subpart the process CO_2 emissions by operating and maintaining CEMS according to the Tier 4 Calculation Methodology in §98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

(b) Calculate and report under this subpart the annual process CO_2 emissions using the procedure in either paragraph (b)(1) or (b)(2) of this section.

(1) Calculate and report under this subpart the annual process CO_2 emissions from EAFs by operating and maintaining a CEMS according to the Tier 4 Calculation Methodology specified in §98.33(a)(4) and the applicable requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

(2) Calculate and report under this subpart the annual process CO_2 emissions from the EAFs using the carbon mass balance procedure specified in paragraphs (b)(2)(i) and (b)(2)(ii) of this section.

(i) For each EAF, determine the annual mass of carbon in each carbon-containing input and output material for the EAF and estimate annual process CO_2 emissions from the EAF using Equation K–1 of this section. Carbon-containing input materials include carbon electrodes and carbonaceous reducing agents. If you document that a specific input or output material contributes less than 1 percent of the total carbon into or out of the process, you do not have to include the material in your calculation using Equation K–1 of this section.

$$E_{CO2} = \frac{44}{12} \times \frac{2000}{2205} \times \sum_{1}^{i} \left(M_{reducing\ agent_i} \times C_{reducing\ agent_i} \right) + \frac{44}{12} \times \frac{2000}{2205} \times \sum_{1}^{m} \left(M_{electrode_m} \times C_{electrode_m} \right) + \frac{44}{12} \times \frac{2000}{2205} \times \sum_{1}^{h} \left(M_{ore_h} \times C_{ore_h} \right) + \frac{44}{12} \times \frac{2000}{2205} \times \sum_{1}^{j} \left(M_{\mathrm{flux_j}} \times C_{\mathrm{flux_j}} \right) - \frac{44}{12} \times \frac{2000}{2205} \times \sum_{1}^{k} \left(M_{product\ outgoing_k} \times C_{product\ outgoing_k} \right) - \frac{44}{12} \times \frac{2000}{2205} \times \sum_{1}^{l} \left(M_{non\text{-}product\ outgoing_l} \times C_{non\text{-}product\ outgoing_l} \right) \quad \text{(Eq. K-1)}$$

Where:

E_{CO2} = Annual process CO_2 emissions from an individual EAF (metric tons).

44/12 = Ratio of molecular weights, CO_2 to carbon.

2000/2205 = Conversion factor to convert tons to metric tons.

$M_{reducing\ agent_i}$ = Annual mass of reducing agent *i* fed, charged, or otherwise introduced into the EAF (tons).

$C_{reducing\ agent_i}$ = Carbon content in reducing agent *i* (percent by weight, expressed as a decimal fraction).

$M_{electrode_m}$ = Annual mass of carbon electrode *m* consumed in the EAF (tons).

$C_{electrode_m}$ = Carbon content of the carbon electrode *m* (percent by weight, expressed as a decimal fraction).

M_{ore_h} = Annual mass of ore *h* charged to the EAF (tons).

C_{ore_h} = Carbon content in ore *h* (percent by weight, expressed as a decimal fraction).

M_{flux_j} = Annual mass of flux material *j* fed, charged, or otherwise introduced into the EAF to facilitate slag formation (tons).

C_{flux_j} = Carbon content in flux material *j* (percent by weight, expressed as a decimal fraction).

$M_{product_k}$ = Annual mass of alloy product *k* tapped from EAF (tons).

$C_{product_k}$ = Carbon content in alloy product *k*. (percent by weight, expressed as a decimal fraction).

$M_{non\text{-}product\ outgoing_l}$ = Annual mass of non-product outgoing material *l* removed from EAF (tons).

$C_{non\text{-}product\ outgoing_l}$ = Carbon content in non-product outgoing material *l* (percent by weight, expressed as a decimal fraction).

(ii) Determine the combined annual process CO_2 emissions from the EAFs at your facility using Equation K–2 of this section.

$$CO_2 = \sum_{1}^{k} E_{CO2_k} \qquad \text{(Eq. K-2)}$$

Where:

CO_2 = Annual process CO_2 emissions from EAFs at facility used for the production of any ferroalloy listed in § 98.110 (metric tons).

E_{CO2_k} = Annual process CO_2 emissions calculated from EAF *k* calculated using Equation K–1 of this section (metric tons).

k = Total number of EAFs at facility used for the production of any ferroalloy listed in § 98.110.

(c) If GHG emissions from an EAF are vented through the same stack as any combustion unit or process equipment that reports CO_2 emissions using a CEMS that complies with the Tier 4 Calculation Methodology in subpart C of this part (General Stationary Fuel Combustion Sources), then the calculation methodology in paragraph (b) of this section shall not be used to calculate process emissions. The owner or operator shall report under this subpart the combined stack emissions according to the Tier 4 Calculation Methodology in § 98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this part.

(d) For the EAFs at your facility used for the production of any ferroalloy listed in Table K–1 of this subpart, you must calculate and report the annual CH_4 emissions using the procedure specified in paragraphs (d)(1) and (2) of this section.

(1) For each EAF, determine the annual CH_4 emissions using Equation K–3 of this section.

$$E_{CH4} = \sum_{1}^{i} \left(M_{product_i} \times \frac{2000}{2205} \times EF_{product_i} \right) \qquad \text{(Eq. K-3)}$$

Where:

E_{CH4} = Annual process CH_4 emissions from an individual EAF (metric tons).

$M_{product_i}$ = Annual mass of alloy product *i* produced in the EAF (tons).

2000/2205 = Conversion factor to convert tons to metric tons.

$EF_{product_i}$ = CH_4 emission factor for alloy product *i* from Table K–1 in this subpart (kg of CH_4 emissions per metric ton of alloy product *i*).

(2) Determine the combined process CH_4 emissions from the EAFs at your facility using Equation K–4 of this section:

$$CH_4 = \sum_{1}^{j} E_{CH4_j} \qquad \text{(Eq. K-4)}$$

Where:

CH_4 = Annual process CH_4 emissions from EAFs at facility used for the production of ferroalloys listed in Table K–1 of this subpart (metric tons).

E_{CH4_j} = Annual process CH_4 emissions from EAF *j* calculated using Equation K–3 of this section (metric tons).

j = Total number of EAFs at facility used for the production of ferroalloys listed in Table K–1 of this subpart.

[74 FR 56374, Oct. 30, 2009, as amended at 75 FR 66461, Oct. 28, 2010]

§ 98.114 Monitoring and QA/QC requirements.

If you determine annual process CO_2 emissions using the carbon mass balance procedure in § 98.113(b)(2), you must meet the requirements specified in paragraphs (a) and (b) of this section.

(a) Determine the annual mass for each material used for the calculations of annual process CO_2 emissions using Equation K–1 of this subpart by summing the monthly mass for the material determined for each month of the calendar year. The monthly mass may be determined using plant instruments used for accounting purposes, including either direct measurement of the quantity of the material placed in the unit or by calculations using process operating information.

(b) For each material identified in paragraph (a) of this section, you must determine the average carbon content of the material consumed, used, or produced in the calendar year using the methods specified in either paragraph (b)(1) or (b)(2) of this section. If you document that a specific process input or output contributes less than one percent of the total mass of carbon into or out of the process, you do not have to determine the monthly mass or annual carbon content of that input or output.

(1) Information provided by your material supplier.

(2) Collecting and analyzing at least three representative samples of the material inputs and outputs each year. The carbon content of the material must be analyzed at least annually using the standard methods (and their QA/QC procedures) specified in paragraphs (b)(2)(i) through (b)(2)(iii) of this section, as applicable.

(i) ASTM E1941–04, Standard Test Method for Determination of Carbon in Refractory and Reactive Metals and Their Alloys (incorporated by reference, *see* § 98.7) for analysis of metal ore and alloy product.

(ii) ASTM D5373–08 Standard Test Methods for Instrumental Determination of Carbon, Hydrogen, and Nitrogen in Laboratory Samples of Coal (incorporated by reference, *see* § 98.7), for analysis of carbonaceous reducing agents and carbon electrodes.

(iii) ASTM C25–06, Standard Test Methods for Chemical Analysis of Limestone, Quicklime, and Hydrated Lime (incorporated by reference, *see* § 98.7) for analysis of flux materials such as limestone or dolomite.

§ 98.115 Procedures for estimating missing data.

A complete record of all measured parameters used in the GHG emissions calculations in § 98.113 is required. Therefore, whenever a quality-assured value of a required parameter is unavailable, a substitute data value for the missing parameter shall be used in the calculations as specified in the paragraphs (a) and (b) of this section. You must document and keep records of the procedures used for all such estimates.

(a) If you determine CO_2 emissions for the EAFs at your facility using the carbon mass balance procedure in § 98.113(b), 100 percent data availability is required for the carbon content of the input and output materials. You must repeat the test for average carbon contents of inputs according to the procedures in § 98.114(b) if data are missing.

(b) For missing records of the monthly mass of carbon-containing inputs and outputs, the substitute data value must be based on the best available estimate of the mass of the inputs and outputs from on all available process data or data used for accounting purposes, such as purchase records.

(c) If you are required to calculate CH_4 emissions for an EAF at your facility as specified in § 98.113(d), the estimate is based an annual quantity of certain alloy products, so 100 percent data availability is required.

§ 98.116 Data reporting requirements.

In addition to the information required by § 98.3(c), each annual report must contain the information specified in paragraphs (a) through (e) of this section, as applicable: